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Department of Energy

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JUL 14 1992

92-WOB-256

Mr. David B. Jansen, P. E.
Hanford Project Manager
State of Washington
Department of Ecology
P. O. Box 47600
Olympia, Washington 98504-7600

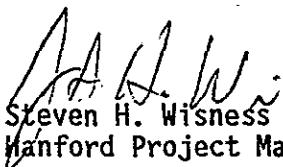
Dear Mr. Jansen:

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RESPONSE TO THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) LETTER OF
MAY 8, 1992, CONCERNING LIQUID EFFLUENT RETENTION FACILITY (LERF)

Ecology has raised a number of issues regarding LERF in the subject letter.
Attached are item by item responses to those comments. With these responses
we feel we have adequately addressed all issues concerning the soil/bentonite
liner for LERF.

If you have any further questions regarding this facility, please contact
Cliff Clark of the Office of Environmental Assurance, Permits and Policy
on (509) 376-9333 or Dana Bryson of the Waste Management Division on
(509) 372-0738.

Sincerely,


Steven H. Wisness
Hanford Project Manager

WMD:DCB

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Attachments

1. Main Issue Comments
2. Construction Quality Assurance Document Amendments
3. Climatological Data

cc: M. Jaraysi, Ecology, w/att
T. B. Veneziano, WHC, w/att
P. T. Day, EPA, w/att
D. L. Duncan, EPA, w/att
D. Nylander, Ecology, w/att
R. J. Julian, WHC, w/o att
D. E. Kelley, WHC, w/o att
L. R. Tollbom, WHC, w/o att
B. A. Davis, SWEC, w/o att
R. E. Lerch, WHC, w/o att



Attachment 1

The following are responses to your comments on the main issues of the March 8, 1992 letter:

Item I. THE MINIMUM TEMPERATURE FOR HANDLING AND SEAMING HDPE:

- a. Having checked all the seam sample testing data for the three basins, Ecology agrees that the seaming integrity was not affected by the low temperatures during seaming process.

Response: None needed.

- b. Ecology insists on reviewing the amended part of the CQA Plan concerning seaming sampling and testing.

Response: Draft amended part of the Construction Quality Assurance (CQA) document which discusses this issue is attached as Attachment 2. The finalized revised CQA document will be available by July 31, 1992.

Item II. THE ISSUANCE AND REVIEW OF ENGINEERING CHANGE NOTICES:

This issue is now addressed by the Site Wide Permit for the Hanford Project. It is Ecology's opinion that adding Ecology technical staff to the normal issuance cycle of an Engineering Change Notice will not cause additional delay to the process. Ecology staff will ensure that their participation in this process will be prompt.

Response: Since this issue is being handled at the higher level, Site Wide Permit, there is no response needed at this level.

Item III. THE REQUIREMENT FOR A SEALED DOUBLE RING INFILTROMETER TEST:

1. Ecology has reviewed the Canadian report by Professors Wong and Haug. We have also spoken to Professor Haug about his work on this issue and the following remarks can be made:

- a. The results and conclusions of the referenced research cannot be directly correlated to the conditions on the LERF Project due to the fact that the percentages of fines passing the #200 sieve of the Ottawa Sand used in the research was less than 10%, while the Olive Gray Silty Sand used on the LERF had 20% fines passing the #200 sieve.

Response: As noted, the percentage of fines in the research samples is not exactly the same as is in the LERF Soil/Bentonite. However, the composition of the research samples does compare closely with the LERF Soil/Bentonite.

- b. More recent studies have been performed by the Canadian

researchers on the East Coast. They freeze/thawed and permeated soil/bentonite samples with up to 15% fines passing the #200 sieve. The permeability of the samples remained unchanged, but instead of swelling the samples shrunk. Professor Haug stated that the percentage of fines passing the #200 sieve at which freeze/thaw cycling will increase permeability is not known for lack of further tests.

Response: We agree. No response required.

2. In Conclusion:

- a. The above referenced research, though not completely applicable, raises our confidence in the integrity of the soil/bentonite liner.

Response: We agree. We have maintained that we have always had and will continue to have confidence in the integrity of the soil/bentonite liners.

- b. There have not been any accurate records of the depth nor frequency of frost experienced by the soil/bentonite liner.

Response: The only records are those kept by Pacific Northwest Laboratory's weather telemetry organization. Records of temperatures are attached as attachment 3 for the period of November 1991 through March 1992. The weather was exceptionally warm during this period. The frost depth was observed to be between three-quarters and one and one-half inches at the LERF construction site by Westinghouse Hanford Company Projects and Kaiser's authorized inspector. The soil/bentonite surface of all three basins was completely remediated to assure the soil/bentonite moisture content and compaction requirements were met before the overlaying liner materials were installed.

- c. However, to gain full confidence and assurance of the permeability of the liner, a number of shelby tube samples, at least 12" deep, must be obtained from the liner in basin #42 (above the designated maximum liquid level) and permeated to check the permeability achieved. This simple test will not impose any delay on the actual construction of the basin, and can be easily correlated to similar tests done at the test pad.

Response: Ecology has not presented any new information that causes DOE to doubt our existing position that freeze/thaw cycling will not adversely impact the ability of the LERF Project Soil/Bentonite liners from performing their intended function. This position, along with extensive analysis, was presented in the March 9, 1992 letter to Ecology. DOE does not consider there to be any technical justification, or permitting requirement, for the proposed Soil/Bentonite sampling.

Item IV. General Remarks On attachment A:

1. *Item 1.1:-* items (q), (r) and (s) on page 25 of the Guidance Document you referenced specify the steps and precautions to be taken during cold weather seaming, including the testing and sampling required. In item (t) on page 26 of the same Document, the last paragraph (Note): "CQC/CQA Documents should be reviewed..."

KEH CQA officers on this project have used a stricter sampling and testing procedure during cold weather seaming which needs to be documented and submitted to Ecology.

Response: Draft amended part of the Construction Quality Assurance (CQA) Plan which discusses this issue is attached as attachment 2. The finalized revised CQA document will be available by July 31. 1992.

2. *Item 3.1.2:- Permeability Considerations:*

Theoretical migration time is not an acceptable measure of permeability of clay liners due to unaccounted for secondary (Macro) permeability which may develop in the liner.

Response: Paragraph 3.1.2 starts out with "For discussion purposes, ..." This paragraph only adds to the discussion of paragraph 3.1.1 which emphatically states the permeability is better than 1×10^{-7} cm/s.

3. *Item 3.2:-* The Project Manager (KEH) of the LERF Project expressed his doubts about having to meet the regulatory criteria of 1×10^{-7} cm/s. The confusion is not on Ecology's part, and we need to be assured the Project Manager knows the required specifications he is to achieve on this project.

Response: Be assured the Project Manager knows that the criteria to be met is 1×10^{-7} cm/s and has always intended to meet this requirement and all records show that this value has been exceeded.

- Thickness, ASTM D 1593
 - Specific Gravity, ASTM D 792
 - Melt Flow Index, ASTM D 1238
 - Carbon Black Content, ASTM D 1603
 - Tensile Properties, ASTM D 638
 - Tear Resistance, ASTM D 1004
- .
- . Material that does not meet the specification requirements will be rejected and removed from the project site.

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2.3.4.2

2.3.4.2

Construction

Following approval of all preconstruction activities, the contractor/installer will be allowed to proceed with FML installation. CQA personnel will observe installation and obtain seam test coupons.

2.3.4.2.1

2.3.4.2.1

Installation

CQA personnel will observe the geomembrane installation for the following items to ensure:

- . Surfaces are free of sharp objects or debris that could puncture the geomembrane.
- . Proper climatic conditions for liner installation and seaming.

Optimum ambient air temperature for production seaming is above 32° F. When the ambient air temperature falls below 32° F during production seaming, two field seam samples per welding machine per day shall be taken.

- Samples will be sent to the laboratory for independent testing.
The laboratory testing will include:
 - Thickness, ASTM D 1593
 - Specific Gravity, ASTM D 792
 - Melt Flow Index, ASTM D 1238
 - Carbon Black Content, ASTM D 1603
 - Tensile Properties, ASTM D 638
 - Tear Resistance, ASTM D 1004
- Material that does not meet the specification requirements will be rejected and removed from the project site.

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2.3.8.2

Construction

Following approval of all preconstruction activities, the contractor/installer will be allowed to proceed with the cover installation. CQA personnel will observe installation of the cover, and obtain seam test couponsamples.

2.3.8.2.1

Installation

CQA personnel will observe the cover installation for the following items to ensure:

- Surfaces are free of sharp objects or debris that could puncture the geomembrane.
- Proper climatic conditions for liner installation and seaming.

~~Optimum ambient air temperature for production seaming is above 32°F. When the ambient air temperature falls below~~

32°F during production seaming, two field seam samples per welding machine per day shall be taken:

- The geomembrane material is clean and free of moisture prior to seaming.
- Welders' qualifications.
- Proper preparation of the seams.
- Grinding of the seam areas is not excessive.
- Geomembrane is not damaged during seaming.
- Placement of material, including prefabricated pieces, is in accordance with approved installation drawings.
- The seaming equipment operates properly and is in accordance with manufacturers' recommendations.
- Samples are taken in accordance with specifications.
- Tension system is installed in accordance with approved drawings.
- Cover is properly anchored around the perimeter and at penetrations.
- Repairs are made in accordance with approved procedures.

2.3.8.2.2 **Installed Seam Testing**

All seams will be 100% visually inspected and 100% tested using nondestructive methods. The nondestructive test methods will include air pressure tests for double-fusion welds or vacuum tests for extrusion welds in accordance with specifications. All seams shall pass nondestructive test examination.

Final seam acceptance will be based on sample destructive testing. This acceptance is based on the criteria that of three samples taken, two of the three shall pass the specified value and the third sample attain a minimum of 95% of the required value.

Destructive testing will be conducted as follows:

- Field seam samples for testing will be taken at the beginning and end of each day for each seaming crew and more often if seaming conditions change.
- When ambient air temperature falls below 32°F during production seaming, two seam samples per welding machine per day will be taken.
- Duplicate samples will be taken. One sample will be tested by the geomembrane contractor and one by CQA personnel.
- Additional samples of seams that visually appear to be defective will be taken at areas indicated by CQA personnel.
- The date, time and equipment, seam number, and seaming parameters will be marked on each sample and recorded in a Geomembrane Field Sample Log.

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
S. H. Wisness, RL	D. B. Jansen, Ecology	Incomming Letter: 9204815
Subject:	RESPONSE TO THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) LETTER OF MAY 8, 1992, CONCERNING LIQUID EFFLUENT RETENTION FACILITY (LERF)	

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